

ARCO NORWAY, Inc.

Hard Minerals Section

Report No. 85-67-47

The Rombaken Project Area, North Norway.

Summary of work done 1984

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Report 85-67-47

THE ROMBAKEN BROJECT AREA, NORTH NORWAY.

SUMMARY OF WORK DONE 1984

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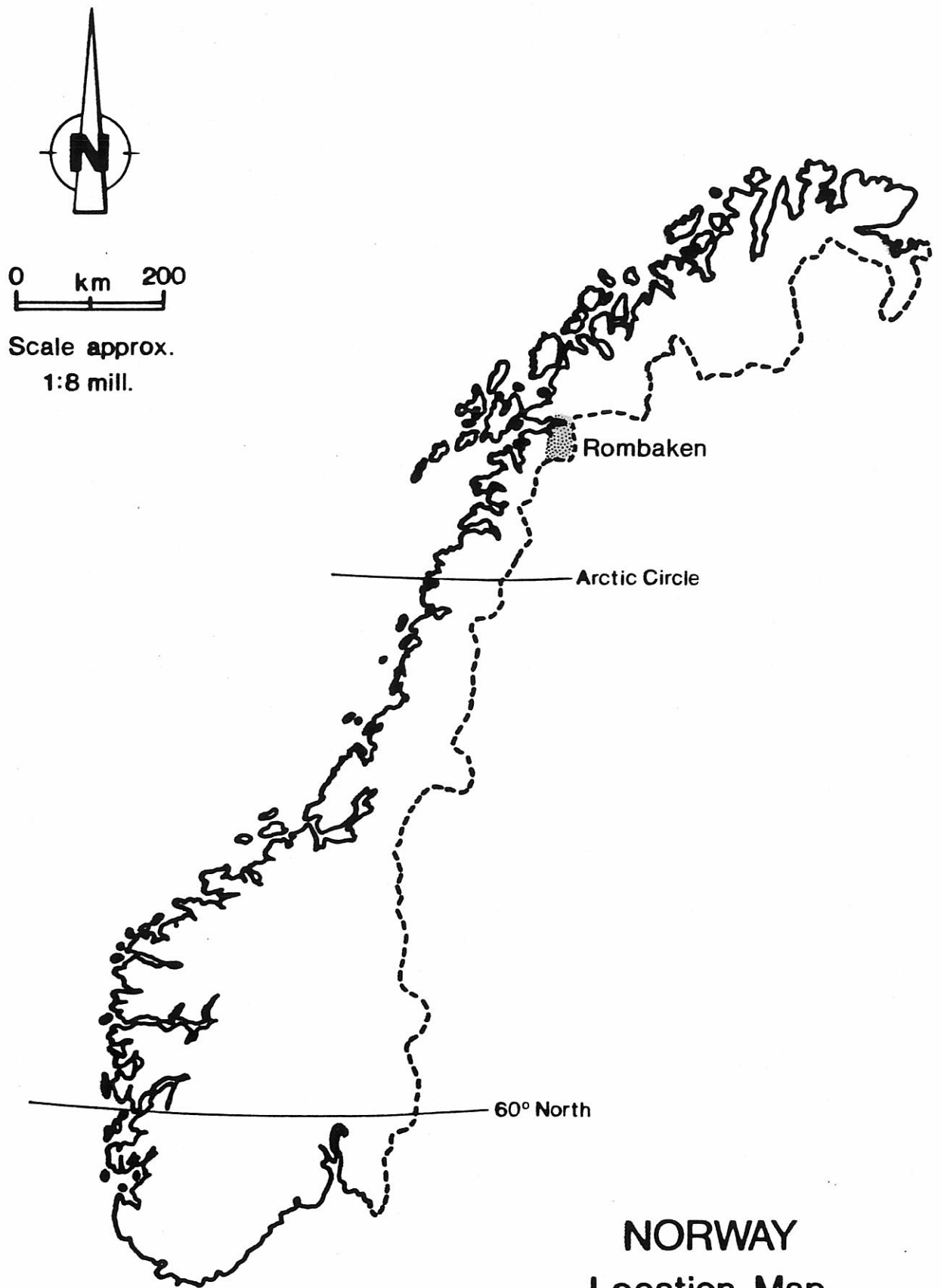


Fig. 1

1. INTRODUCTION

The Rombaken project area is situated east of the town Narvik in Northern Norway, see fig. 1.

Geologically the area occurs within a Precambrian (lower-middle Proterozoic) window, see fig. 2.

Potentially economic targets are sedimentary hosted Zn-Pb-Ag deposits and possibly epithermal Au-mineralization.

The project commenced in 1983 and all relevant data with regard to physiography, access, title situation and previous work including ARCO's exploration program during 1983 is summarized in an earlier report:

Flood, B., 1984: The Rombaken project area, North Norway. Summary of work done 1983 and work programme proposal for 1984. ARCO Norway, Inc. Int. report no. 84-670-19.

Very briefly, this work consisted of geological mapping, and stream sediment geochemistry and some lithogeochemistry over an area of around 700 km². Well-defined, multi-element anomalies were found particularly on Zn, Pb and As and to a lesser extent also combined with Cu and Au. Free gold was found in heavy fraction samples from a few streams.

2. WORK PROGRAMME 1984

The field work at Rombaken was carried out between June 12 and October 20.

The personnel varied through the season with:

- 3-5 geologists
- 1 geochemist
- 1 geophysicist
- 2-4 field assistants
- 1 man on trenching (1 week)
- 4 drillers (September 10 - October 20)

The project supervisor from Oslo visited the area at regular intervals through the season.

The following work has been conducted re the project in 1984:

- DIGHEM EM and magnetic survey, helicopter flown prior to field season.
- Ground geophysical surveys: GENIE and magnetics.
- Geological mapping in scale 1:20,000 and 1:5000.
- Geochemical heavy fraction stream sediment survey.
- Stream sediment (traditional) fill-in sampling.
- Lithogeochemistry: Grid sampling, profile sampling and geological sampling.
- Trenching totalling 79 m.
- Diamond-drilling totalling 1752 m.

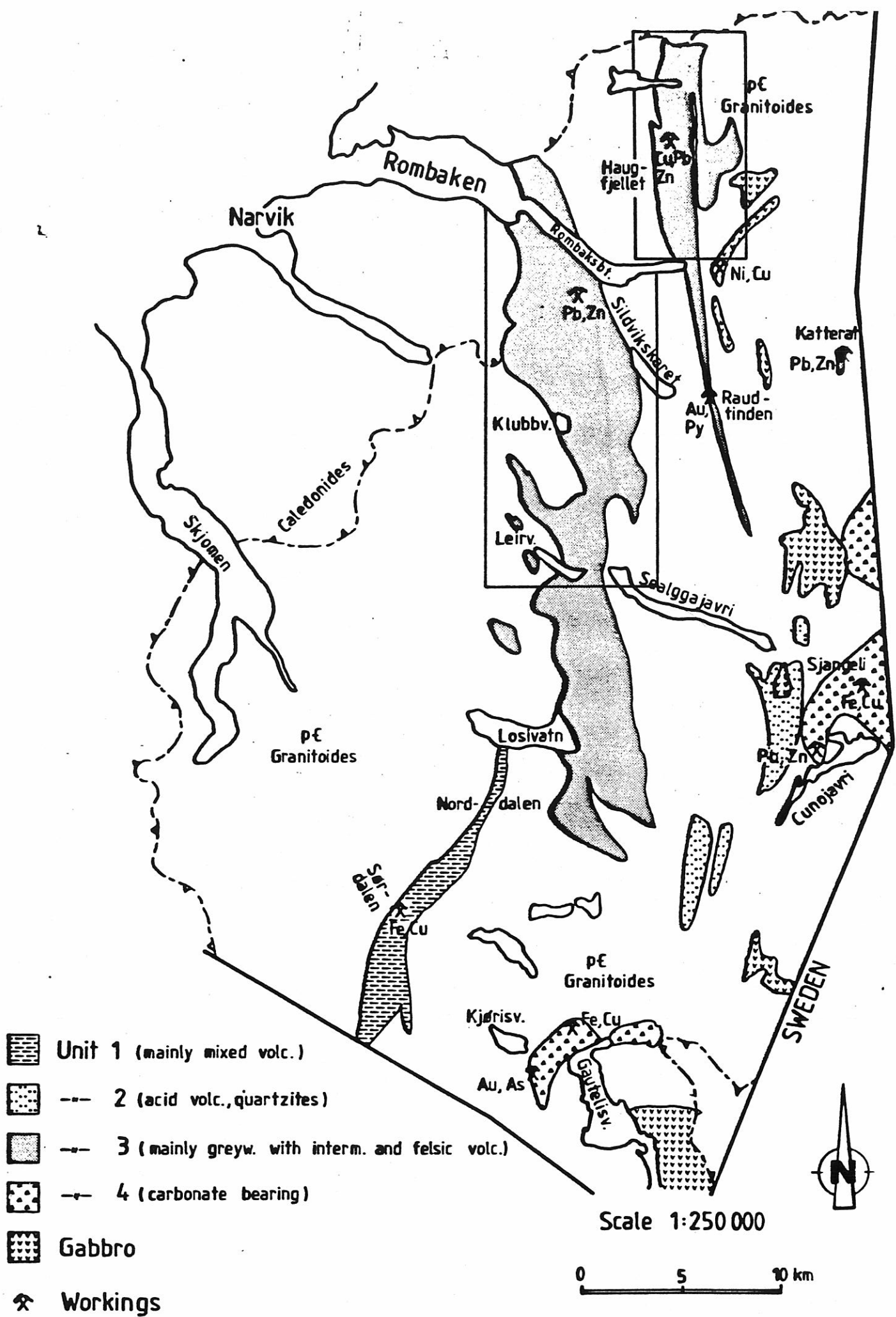


Fig. 2

ROMBAKEN GEOLOGICAL MAP

Details of the geochemical sampling programs are given in Table 1.

Table 1. The geochemical sampling in Rombaken 1984.

Rock grid sampling	358
Rock chip profile sampling	226
Rock scree sampling	41
Rock geological (mineralization) including boulders	206
Stream sediment infill sampling	36
Stream sediment heavy fraction	112
Total number of surface samples	979
+ Trench samples	29
Core samples	152
Total number of samples 1984	1160

This work is treated in detail in the following reports:

DIGHEM Ltd.: DIGHEM III survey of the Bamble and Rombak areas, Norway. Int. ARCO Norway, Inc. report no. 84-10-24.

Abildgaard, P.: Preliminary geophysical report - DIGHEM Survey-Rombaken Project, Norway, May, 1984. Int. ARCO Norway, Inc. report no. 84-67-27.

Skaldebø, O.A.: Heavy fraction stream sediment sampling - The Rombaken project, North Norway, Int. ARCO Norway, Inc. report no. 84-67-32.

Thomassen, B.: Geology and Mineralization - Field Report, 1984 - Klubbv. area, Int. ARCO Norway, Inc. report no. 84-67-34.

Flood, B.: Geochemical surface sampling, Rombaken project, North Norway, 1984. Int. ARCO Norway, Inc. report no. 84-67-35.

Abildgaard, P.: Ground geophysical work, Rombaken Project, 1984. Int. ARCO Norway, Inc. report no. 84-67-40.

~~Thomassen, B., Bielak, J., and Flood, B.: Geology of the Haugfjellet area including trenching and drilling. Rombaken project. Int. ARCO Norway, Inc. report no. 84-67-45.~~

Short summaries of this work will be divided between regional work (the whole Rombaken area) and the two main areas of interest: Haugfjellet and Klubbvatnet.

Søknad om støtte til prospektering i Nord-Norge.
Haugfjellet, Rombaken prosjektet.

2.1 Regional Work

2.1.1 Helicopter borne DIGHEM-EM and magnetic survey

A total of 583 line km with 200 m line spacing was flown in late May. The area is shown in fig. 3 which also indicates the rough topography in the southern part affecting the altitude of the bird.

Haugfjellet A combined DIGHEM EM and enhanced magnetic map is shown in fig. 4. It shows a concentration of EM anomalies in the western and central part of the Haugfjellet supra-crustal inlier. This anomalous trend coincided well with the geochemical multielement anomalies from 1983 and was given highest priority in the 1984 follow-up program.

Klubbvatn This name is used for the total area flown south of Rombaksbotn. A large number of EM-anomalies occurs on the DIGHEM map but the anomaly pattern is much more spread and irregular than at Haugfjellet, see fig. 5. The central mag. high west of Blåisvn. is clearly related to mafic volcanics, see fig. 13. Since the geochemical sample density due to topography and drainage is more erratic, the relation between geochem.-geophysics is less obvious and a labourous follow-up work is required.

2.1.2 Heavy fraction stream sediment geochem.

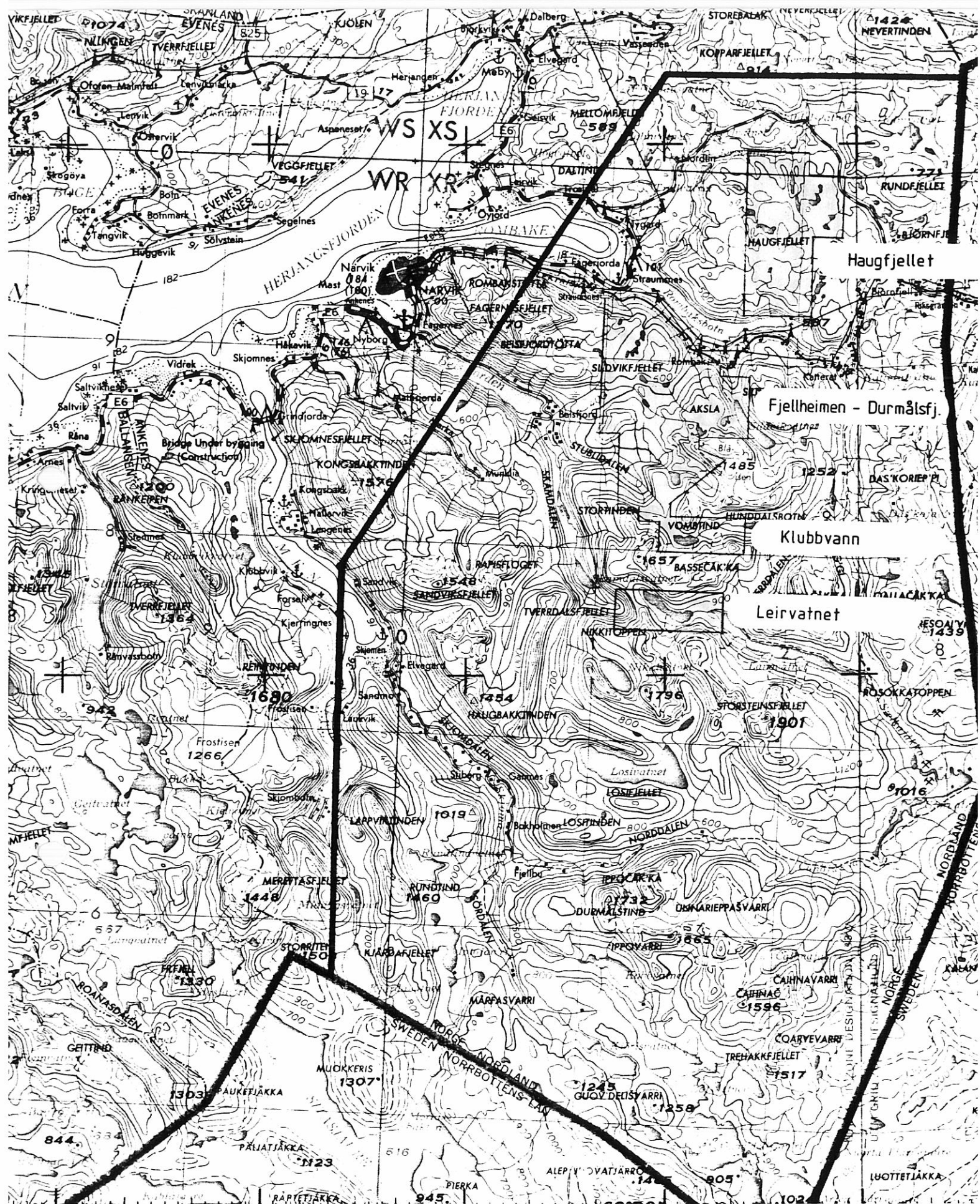
Altogether 112 samples were collected last season in addition to 56 samples collected in '83.

The samples were taken from streams which returned anomalous Au values in the earlier stream sediment samples. The short and often steep drainage pattenes in the anomalous areas indicates that relatively low Au values are significant when compared to the total sample population of the project.

The samples were sieved and panned on site to a semi-concentrate which was later concentrated on a Goldhound 18" concentrating wheel.

The concentrates were first examined under a microscope and thereafter sent to our Tucson Lab for assays. The results are shown in Table 2.

The best anomalies have been designated Varden E outlined by the samples 8403523-26 and situated within eastern Haugfjellet where a number of more scattered anomalies occurs. Another, Hunddalsbotn is defined by the samples 8403577-80 and in an extension of the Klubbv. anomaly from last year.



ROMBAKEN

AREA FLOWN BY DIGHEM '84

Fig. 3

Table 2. Results from heavy fraction sampling.

Free gold was found in 8 of the samples:

Sample Number	Map Sheet	Location	Number of Au grains	Au Assay ppm
8403524	1431 IV	Haugfjellet	1	11,166
8403533	"	"	1	2,340
8403542	"	"	1	17,057
8403552	1431 III	N of Cunojokka	1	22,670
8403553	"	"	1	7,509
8403559	1431 II	"	1	0,050
8403577	1431 IV	Hunddalsbotn	1	13,560
8403578	"	"	2	14,486

Another 16 samples returned high gold assays ranging from 0,103 to 10,097 ppm Au:

Sample Number	Map Sheet	Location	Au assay (ppm)
8403523	1431 IV	Haugfjellet	0,381
8403525	"	"	0,816
8403526	"	"	0,138
8403533	"	"	2,340
8403538	"	"	0,116
8403541	"	"	0,139
8403548	"	"	0,140
8403549	"	"	0,106
8403575	1431 II	NW of Cunojavri	1,632
8403579	1431 IV	Hunddalsbotn	0,120
8403580	"	"	0,189
8403585	"	E of Leirvatnet	0,315
8403592	"	Hunddalen	0,292
8403593	"	"	0,224
8403595	"	Yttre Sildviks- skardet	0,103
8503611	"	Haugfjellet	10,097

A third anomalous area indicated in '83 and confirmed in '84, Cunojakka, occurs partly within the granitoids between Losivatn and Cunojavri further south, see fig. 2.

Follow-up was started only on Varden E (the easternmost part on the geological map fig. 7) where profile chip sampling was conducted, see p. 9.

Further follow-up both on Varden E and the other anomalies is warranted.

2.1.3 Regional mapping and rock sampling

Raudtinden, ca. 6 km south of the head of Rombaksbotn, attracted interest in '83 due to a sample from a strongly pyritic greywacke which assayed 3.3 ppm Au.

Altogether 19 chip samples were collected from the same area this year without confirming the previous high Au value.

The Losivatn - Cunojavri area displays rusty horizons mainly in shale and greywackes similar to those observed in the Haugfjellet and Klubbvt. area where strong stream sediment anomalies occur. Losivatn is the southernmost extension of the Klubbvatn trend or basin, see below. Near Cunojavri is the possible extension of the Haugfjellet trend, but with a facies difference. These lithologies are characterized by quartzites, partly conglomeratic and felsic volcanics with shales (rusty), mafics, quartz-sericite schist and sub-ordinate carbonate beds.

The Shangli carbonate bearing units along the Swedish border were outside our area of interest since they are claimed by others.

The objective with this work was to map and sample the rusty units and to check the quartzites earlier believed to be Caledonian autochthone.

Mapping showed the quartzites to be part of the Proterozoic package. 14 chip samples across rusty units showed only one Zn and three Au numbers (14-22 ppb) above the 90%ile value as determined from the grid sampling at Haugfjellet.

No further exploration for base metals is warranted in this area, but the Au heavy-fraction anomalies should still be pursued.

2.1.4 In-fill stream sediment geochemistry

Minor stream sediment infill sampling was conducted in these areas:

- Leirvatnet (east end)	15 samples
- Cunojavri	9 samples
- Sjørdalen	12 samples

Only the samples from Leirvatnet were anomalous in Cu, Pb, As and Au, confirming last years sampling. Anomalous values are based on last year's statistics.

Re. the two other areas, two samples were anomalous in Au at Sjørdalen, one sample was anomalous in Au and one in As at Cunojavri. Too few samples have been collected from the last two areas to give any conclusive results.

2.2 Haugfjellet area

Due to the coincidence of geochemical and DIGHEM anomalies, an 8 km long baseline with a grid system of approx. 6 km² was erected on central west Haugfjellet. Mapping outside the grid was conducted in scale 1:20.000 while all work on grid has been done in scale 1:5000.

2.2.1 Geological mapping

Photos of the 1:20,000 and 1:5000 maps are shown in fig. 6 and 7.

The supracrustal package on Haugfjellet consists mainly of:

- Fine-grained, generally weakly graphitic greywackes (turbidites).
- Black graphitic schist interbedded with greywackes.
- Light (felsic) and grey green (intermediate) tuffs (partly porphyric) and tuffites especially in the western part.
- Amphibolites, arkosic sediments and thin carbonate beds in subordinate amounts.

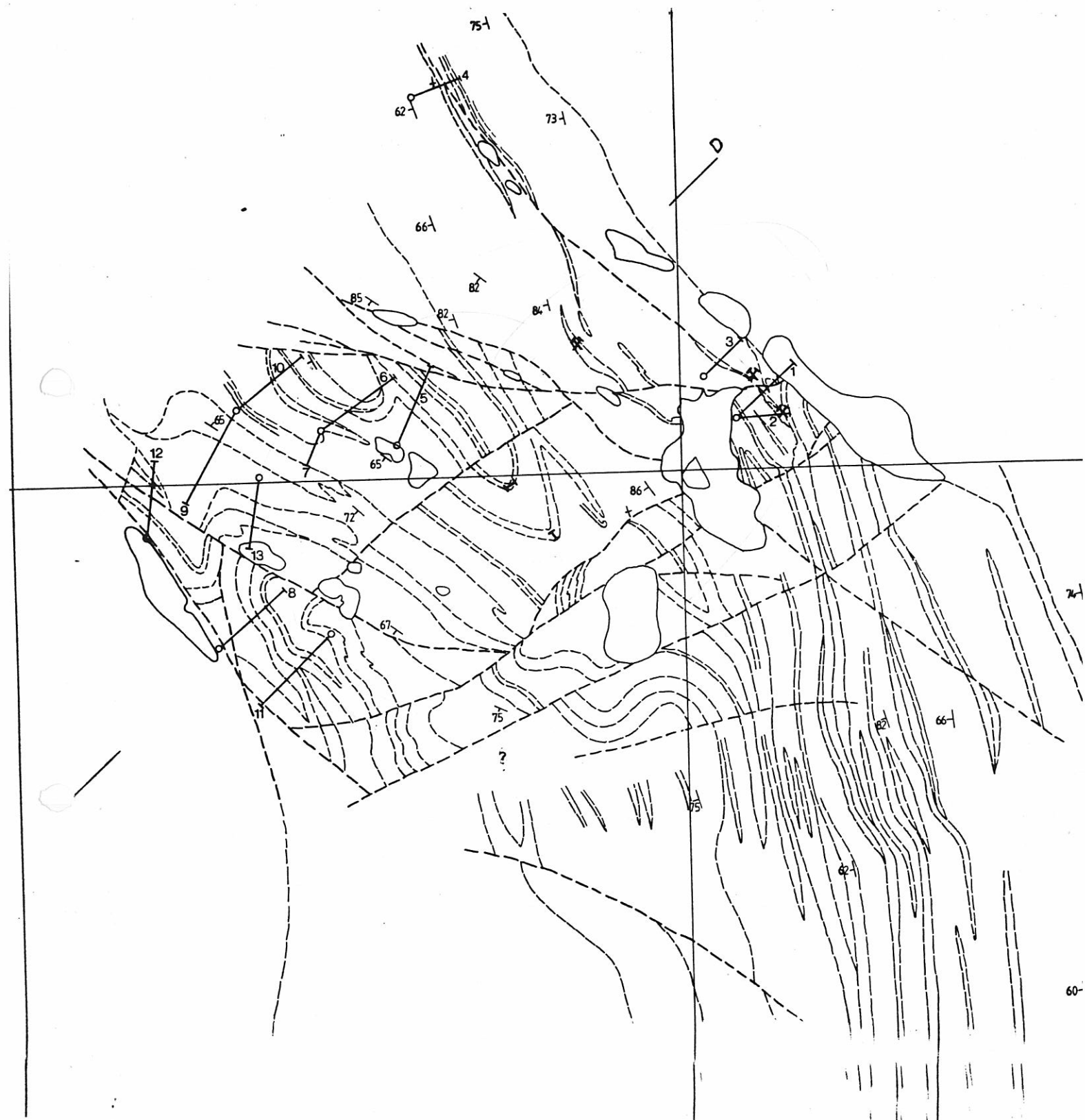
The supracrustals are surrounded by intrusive granites. The contacts are in places tectonic, particularly along the "dykes" within the package. The strike is mainly north-south or northwest-southeast with a steep westerly dip. More structurally complex areas occur around Kisryggen to the northwest and south of Varden. Interpretive sections from these areas are shown in fig. 8 and 9.

Mineralization

- Characteristic for the whole of Rombaken supracrustals, and particularly for Haugfjellet, are the rusty horizons. These are mainly due to iron-sulfides, particularly in the black shales but also in the other units. High concentrations of up to 20-30% may occur over several meters width and concentration of 1-5% is common over several tens of meters. The mineralization occurs in thin conformable bands, as dissemination and as fracture-fillings.
- Arsenopyrite occurs as fine-grained disseminations, in places as thin bands. It is most common in black shales and bedded tuffs.

Fig. 7 B

DDH localities, Haugfj.



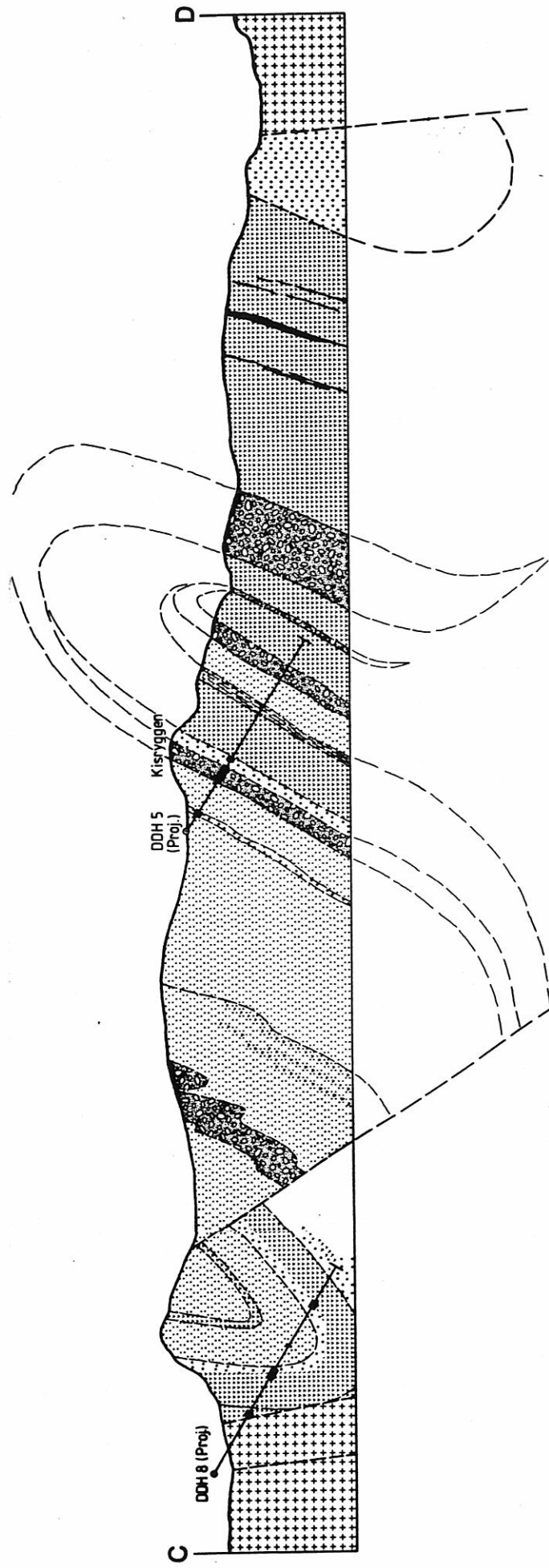


Fig. 8

LEGEND:

- | | | | |
|--|-------------------------------|--|---|
| | Granite | | Graphitic schists |
| | Intraterritorial conglomerate | | Mafic tuff and tuffites |
| | Brown graywacke | | Fault |
| | Gray graywacke | | Intervals containing est. +5% sulphides |

0 metres 100

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Hard Minerals Section

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Haugfjellet - Kisryggen Cross Section

Drawn/Traced: JB / AA	Date: Mar. 85	Centre: Oslo
Report: Project	Drawing: Map Sheet	Scale:

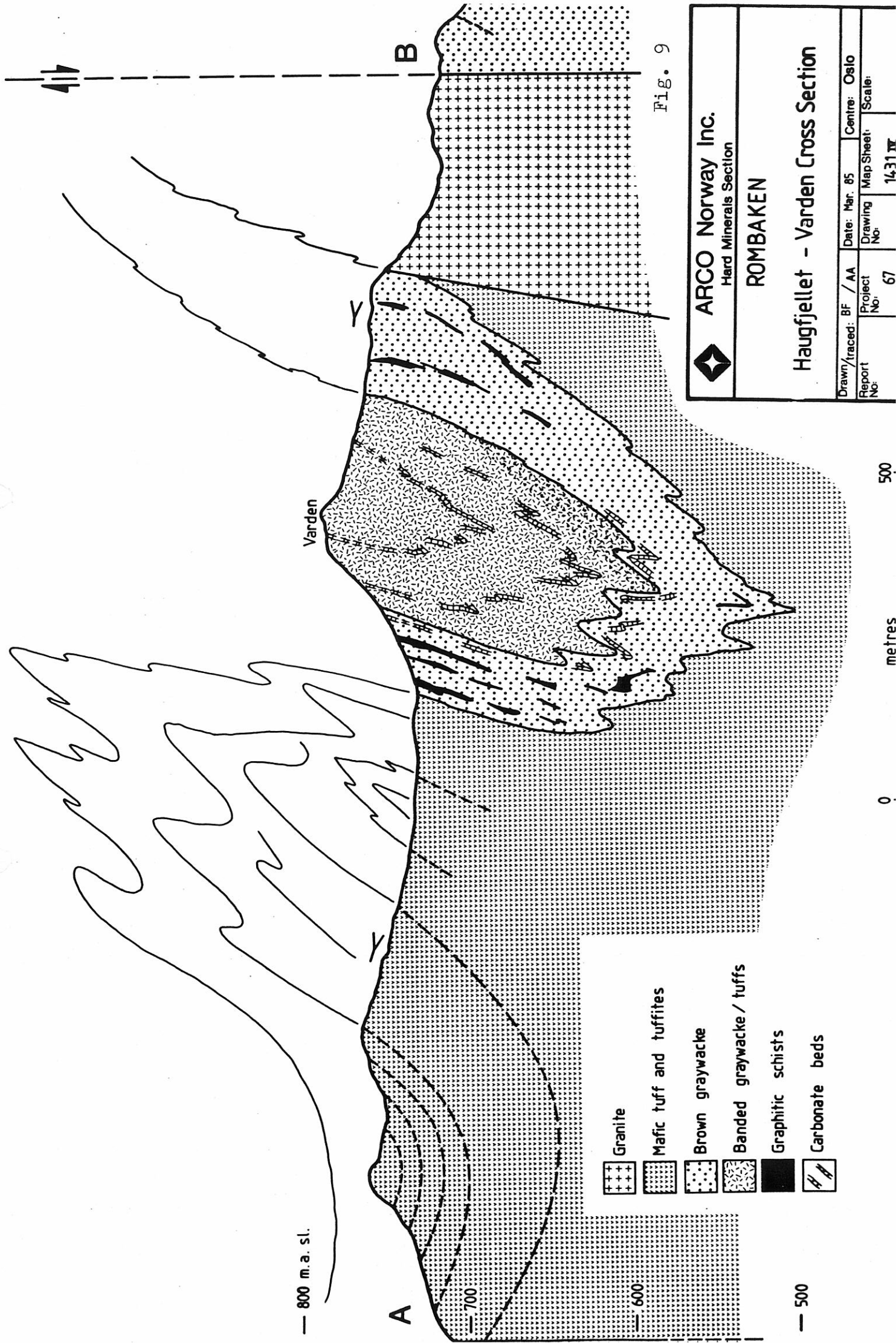


Fig. 9

 ARCO Norway Inc. Hard Minerals Section		Date: Mar. 85		Centre: Oslo	
		Drawing No. 67		Map Sheet 14.31 IV	
ROMBAKEN		Drawn/Traced: BF / AA			
Haugfjellet - Varden Cross Section		Project No.		Scale:	
Report No.		Map Sheet		Scale:	

- Base metal mineralization is mainly sphalerite and galena with a ratio of around 3:1. They occur as massive lenses, dissemination, but mainly as fracture fillings in places resembling stockwork. They occur both in the clastic sediments and in the volcanics but are most commonly associated with the carbonate beds. An association with iron sulfides is normal, but the highest concentrations of iron sulfides are mainly "sterile" re. basemetals.
- Precious metals, both Au and Ag show their highest concentration associated with high basemetal numbers. Although one grid sample assay 0.4 ppm Au without anomalous Cu, Pb, Zn values. The free Au observed in heavy fraction samples from a local drainage system indicates that free gold does occur in the Haugfjellet mineralization system.

2.2.2 Geophysical survey

For proper ground control and eventual drill hole location on DIGHEM anomalies, a GENIE EM and total field mag survey was conducted over most of the Haugfjellet grid.

A work summary is given in Table 3, the GENIE results together with plotting of DIGHEM anomalies are shown in fig. 10.

Table 3. Ground geophysical work, Rombaken 1984

Area	GENIE 1-km	Mag 1-km	Orientation	Line-spacing m	Coil-spacing m
Kisryggen	5.6	7.1	N45E	100	30
Haugfjellet-N	6.6	13.8	E-W	200	50
Varden	9.6	7.1	E-W	100	30/50
Klubbvann	4.1	4.1	E-W	200	50
Hunddalsbotn	3.3	3.3	N-S/E-W	3 + 4 lines	50
Blåisvann	1.8	1.8	E-W	2 lines	50

Totally: Haugfjellet: 22 km GENIE and 28 km Mag, 48 man-days

Klubbvann Area: 9.2 km GENIE and 9.2 km Mag, 18 man-days

Note: At. Varden, even numbered lines (L 95400, 95600, etc.) have 50 m coil spacing

uneven numbered lines (L 95500, 95700, etc) have 30 m coil spacing.

Generally a good correspondence was obtained between helicopter borne and ground EM. The latter was used both when determining the drill hole program and in construction of the geological map.

The strongest EM-anomalies are clearly associated with graphitic schists and/or semi-massive iron-sulphides. The medium strength and weaker anomalies are potential base metal indicators.

At Haugfjellet the ground mag. results are inconclusive.

2.2.3 Geochemical surveys

Around 600 rock samples have been collected on Haugfjellet, excluding samples from trenches and drill holes.

Grid sampling: 358 samples were collected on the Haugfjellet grid with spacing 200 x 100 m. Each sample constitutes approx. 2 kg of 5cm chips, chipped within a circle of 5 m radius at the sample point. The samples have been assayed for

Cu, Pb, Zn, Ag, Au, As, Sb, Fe

at our Tucson Lab. Data processing of the results was done by Anaconda in Denver.

Statistical parameters based on 323 samples are shown in Table 4 and compared with values from Krauskopf's. average shale.

An anomaly map with Cu, Pb, Zn >90%ile and >95%ile values is shown in fig. 11. The majority of anomalies occurs within the central part of the grid (ca. 1 km²), an area where most of the other elements also tend to show anomalous concentrations.

Table 4. Comparative Statistics
Haugfjellet Area

Au in ppb, other elements in ppm

	<u>Haugfjellet Grid (n = 323)</u>				<u>Krauskopf</u> <u>av. shale</u>
	<u>Mean</u>	<u>90%ile</u>	<u>Lowest</u>	<u>Highest</u>	
Cu	62	101	2	253	57
Pb	97	121	2	6483	20
Zn	261	379	83	5015	80
Au	5	13	1	446	<50
Ag	0.33	0.1(?)	0.1	10	0.07
As	101	175	2	5030	7
Sb	14	25	2	353	1.5

Table 4. Comparative Statistics
Haugfjellet Area (Cont'd)

	<u>Mean</u>	<u>90%ile</u>	<u>Lowest</u>	<u>Highest</u>
<u>Kisryggen including Camp Black Shale Profiles (n = 122)</u>				
Cu	66	108	2	437
Pb	87	157	2	2073
Zn	275	335	63	5342
Au	6	12	1	106
Ag	0.2	0.1	0.1	4.7
As	71	144	2	1591
<u>Varden E Profiles (n = 57)</u>				
Cu	91	235	2	428
Pb	27	72	2	145
Zn	147	215	15	569
Au	21	45	1	387
Ag	0.2	0.1	0.1	4
As	86	165	2	1079

Profile sampling: Profiles ranging from 5 m to 600 m long have been chip sampled, usually with one sample representing a 5 or 10 m profile length. Most of this sampling was done on Kisryggen - the diamond drill location to the northwest. The objective of this sampling was to test the more conspicuous rusty units. Global statistics from Kisryggen are shown in Table 4 which show little difference from the statistical sampling of the whole Haugfjellet grid.

Sampling along profile 95600 and 75700N south of Varden confirmed the general low base metal values on semi-massive iron-sulphides, which here occur in a fold closure.

Two profiles 190 m and 250 m long were chip-sampled across a rusty black shale/greywacke at the heavy fraction anomaly Varden E around 20000E outside the grid area.

Statistics from the assay results are shown in Table 4.

The grid sampling lithogeochemistry at Haugfjellet has clearly defined a base (precious) metal anomaly at central Haugfjellet. From Table 4 one should note the following:

- The high mean values for Pb and Zn within the grid system (including Kisryggen).
- The high mean As in all areas as a possible Au indicator.
- The highly elevated Au values at Varden E.

Geological (mineralization) sampling:

In addition to the systematic sampling programs described above, a number of rock samples have been collected by the field geologists during mapping.

These were mainly taken as grab samples or chipped over 0.5-1 m to check observed mineralization.

Selected results from this sampling are shown in fig. 12. When comparing these results with the geological map fig. 7, it is seen that most of the interesting results fall within the "Banded silicified greywacke/tuffite with carbonate" at central Haugfjellet. These also coincide with the anomalous area indicated by the grid sampling, see above.

From this unit 25 samples were collected; the results are summarized in Table 5.

Table 5

Area/unit	No. of Samples	Zn	Pb	Cu	Au
Central carbonate bearing unit	25	1,400 (549-226,818)	5377 (128-66,383)	335 (40-2264)	0.019 (<0.005-1.418)
		Ag 14.7 (<0.5-109)	As 302 (<10-12,000)	Sb 82 (<10-749)	Fe% 6.61 (4.66-14.5)

Detailed follow-up work including drilling is planned for this area.

2.2.4 Trenching

Two trenches totalling 29 meters and three trenches totalling 19 meters were blasted at Kisryggen and Varden respectively, see fig. 7.

This work was supplementary to profile sampling and diamond drilling and was aimed at subsurface examination of rusty units with up to 25% iron-sulfides.

The trenches were sampled at 1 to 6 meter intervals with a total of 15 samples.

The best result was obtained from the southernmost trench at Kisryggen showing:

6 m of 0.25% Cu + Pb + Zn.

It confirmed concurrent observation showing a poor association between semi-massive iron sulphides/base metals.

2.2.5 Diamond drilling

The diamond₂ drilling was concentrated within an area of around 1 km² in northwestern part of Haugfjellet.

The drill holes were positioned to test geological surface indications - sulphide rich zones, helicopter and ground geophysical anomalies and a few weaker geochemical anomalies from the profile sampling at Kisryggen.

Expected targets were:

- economic Zn, Pb, Ag (Cu) concentration
- disseminated Au within an environment of widespread iron and base-metal sulphides as well as As, Sb and C.

Thirteen holes with a total length of 1752 meter were drilled. The horizontal projections of the holes are seen in fig. 7 and a NE-SW section through the drill area with DDH 5 and 8 projected is shown in fig. 8.

The cores (which are stored in Narvik) have been split and a total 112 samples was sent to Tucson Lab. for assays on

Cu, Pb, Zn, Ag, Au, As, Sb, Fe (and a few on S)

Anomalous Au occurred in several of the drill holes, but numbers above 0.1 ppm, occur only in two holes (results in ppm):

DDH 1	78.3-78.85 m	0.326 Au, 1868 As, 62 Sb, 161 Cu, 127 Pb, 1057 Zn
DDH 2	7.0-9.61 m	0.141 Au, 133 As, 94 Sb, 300 Cu, 3168 Pb, 6651 Zn, 13 Ag.

Base metal sulphides were not found in economic concentrations. Ore grades occur in places, but not with sufficient width. However, a significant mineralization system has been indicated, particularly for Zn and Pb as demonstrated in the following holes:

DDH 1	3.0-7.36 m	0.69% Zn, 0.30% Pb, 12 g/t Ag
DDH 2	3.09-9.61 m	1.3% Zn, 0.47% Pb, 13 g/t Ag
DDH 3	25.3-27.3 m	0.78% Zn, 0.33% Pb, 4.3 g/t Ag
DDH 4	31.8-39.7 m	1.3% Zn, 0.2% Pb, 8 g/t Ag
DDH 6	80-90 m	0.51% Zn, 0.11% Pb
DDH 9	162.5-175.8 m	0.74% Zn, 0.25% Pb
DDH 11	105-126 m	0.4% Zn
DDH 12	10-27.4 m	0.6% Zn, 0.12% Pb
DDH 12	103.5-115.6 m	0.65% Zn, 0.26% Pb

2.3 Klubbvatn area

This area is outlined in fig. 2. Inaccessibility, cover in places and lack of geological information resulted in more of a reconnaissance program here than at Haugfjellet.

2.3.1 Geological mapping

Part of this area was covered by geological mapping at 1:20,000 scale as shown in fig. 13.

Clear similarities exist between the two areas, Haugfjellet and Klubbvatnet, but also some important differences occur which are listed below:

- Thick amygdaloidal flows of andesitic volcanics indicating a more proximal situation than Haugfjellet's green tuffs and tuffites.
- Sedimentary breccias mainly flanking the andesites. These are much more pronounced units than the infraformational conglomerates at Kisryggen.
- Quartzites, partly associated with the andesites, which may be recrystallized felsic volcanics.
- Exhalites as thin magnetite BIF and garnet-quartzite in Klubbdalen and W of Blåisvatn. The garnet-quartzite resembles "ore-quartzites" in central Sweden.
- More greywackes, fewer black schists.
- Mineralization is generally similar, but the lack of arsenopyrite is typical as shown by comparing Tables 5 and 6.
- Also, mega-fractures to a larger extent control mineralization at Klubbvatn.

2.3.2 Geophysical surveys

No systematic follow-up of DIGHEM anomalies was started in '84. A few anomalies were checked and confirmed by GENIE-EM, the extent of this work is outlined in Table 3.

2.3.3 Geochemical sampling

Due to topography, no systematic grid sampling was carried out in the Klubbvatnet area. Most of the rock sampling was done in a similar manner and for the same purpose as the geological (mineralization) sampling at Haugfjellet.

However, a systematic sampling of scree in Klubbdalen attempted to test high inaccessible areas and 41 samples were collected. Selected sample results are shown in fig. 14 and median and ranges for 31 scree samples are shown in Table 6.

TABLE 6. SUMMARY OF SCREE CHIP SAMPLES, KLUBBDALLEN

Medians and ranges in ppm

Source mineraliz. ref. Map 7	Number of samples	Zn	Pb	Cu	Au	Ag	As
B	17	458 (152-2786)	200 (24-2361)	99 (33-454)	0.009 (<0.005-0.077)	<0.5 (<0.5-2.3)	29 (<10-588)
Mainly G	8	153 (94-301)	43 (27-142)	47 (24-278)	0.022 (0.007-0.043)	<0.5 (<0.5)	27 (40-72)
H	6	158 (130-265)	26 (18-302)	25 (21-27)	<0.005 (<0.005-0.075)	<0.5 (<0.5)	<10 (<10-11)

When comparing the two areas, Klubbv. and Haugfj., a study of the correlation coefficients is instructive, see Table 7, where a difference in geochemical environment is indicated.

Table 7

ROCK SAMPLES

CORRELATION COEFFICIENT

	Klubbv. area	Haugfj. area
Ag-Au	0.63	0.21
Au-As	0.01	0.55
Ag-Pb	0.65	0.90
Pb-Au	0.73	0.25
Pb-Zn	0.23	0.87
Zn-Cu	0.06	0.68
Cu-Pb	0.13	0.60

2.3.4 Trenching

Five trenches with a total length of 31 m were blasted in Klubbv. dalen, see fig. 13. Fourteen samples representative between 1 and 4 meter were collected.

This program was mainly aimed at testing rusty fracture zones and all samples are particularly anomalous in Zn and Pb, and partly in Ag.

A selected sample assayed:

13.6% Zn, 2.9% Pb, 219 g/t Ag

The best width assayed:

2 m 1.3% Zn, 0.7% Pb, 4.4 g/t Ag, 0.18 g/t Au

Further work on these fracture zones should be carried out.

3. MODEL CONCEPT AND CONCLUSION

The type of mineralization and geological setting at Rombaken has led to the following model concept.

The most likely target will be a sedimentary-hosted, massive Zn - Pb - Ag deposit. The Zn/Pb ratio will be approximately 3/1 and the ore will contain around 5% of iron sulphides.

The ore and its host rocks have probably been deposited on an Archean crust in an intracratonic basin. Reactivation of Archean fractures extending into the overlying package caused formation of 2nd and possibly 3rd order basins with deposition of sedimentary breccias. The active fractures were also channel-ways for volcanic extrusive material, exhalites and mineralizing agents.

Klubbvatn is probably part of a basin with proximal deposition while Haugfjellet is assumed a different basin with a more distal character, and also a different geochemical environment, see fig. 15.

The fractures and/or faults along the basin margins probably also controlled the later Proterozoic granitic intrusions. Hence, the supra crustals from different basin, to day appear as separate inliers in the granites.

The high metal surplus shown by grid sampling at Haugfjellet, see Table 3 still makes this part an attractive target. Probably an economic concentration will require some "assistance" by tectonic or structural thickening and the best target may be found in the Varden syncline, see fig. 9.

At Klubbvatn a primary massive target is assumed more likely, but here also the observed megafracture remobilization may have some potential.

The gold mineralization may fit an epithermal type model and will due to the size of the area require a considerable effort to be found.







0 km 1

LEGEND:

- Granites
- Supracrustals undiff.
- Black graphitic shale (gen pyritic and minor graywacke)
- Grayw. (dom.) / black shale
- Grayw. with mafic and felsic v. Sulph. rich to the North
- Amphibolite (mafic tuff)
- Quartz - feldsp. rock (Arkose)
- Banded silicified grayw. / tuffites with carbonate
- Facing
- Geological boundaries
- Bedding trends
- Fracture zones
- Strike / dip bedding





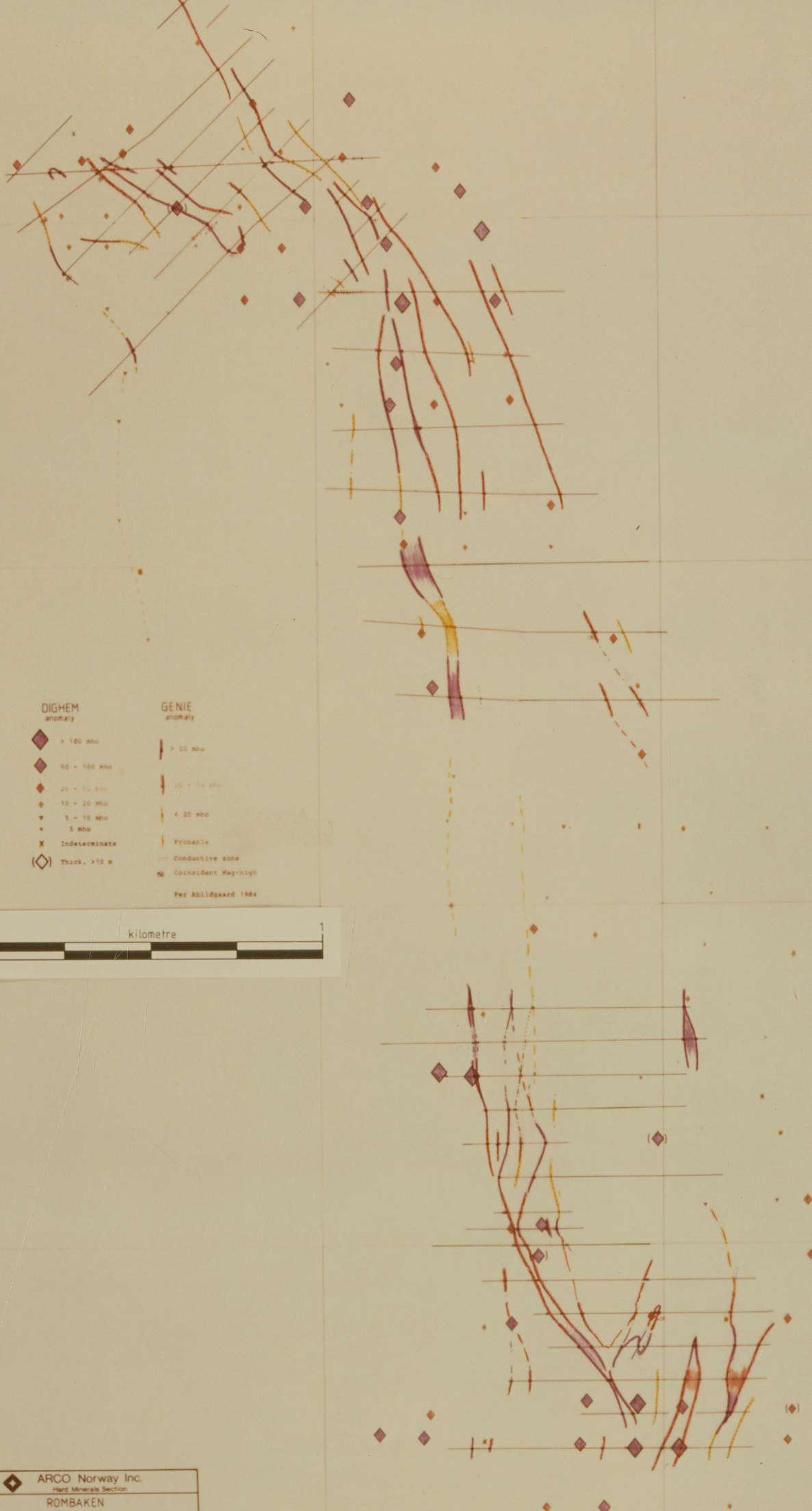
LEGEND

- 1 Gneisses
- 2 Amphibolite, black shale, rich in garnet and/or pyroxene
- 3 Mixed black shale and greenschist
- 4 Brownish-grey greenschist with subordinate black shale
- 5 Pelitic greenschist (tuffite?) pyroclastic sedimentary breccia? (diacygne)
- 6 Greenish greenschist (acid tuffs or tuffites?) with subordinate grey and brown greenschist
- 7 Banded greenish and blackish greenschist/tuffs, fine-grained and silicified
- 8 Carbonate beds, observed/extrapolated
- 9 Geological boundary
- 10 Strike-slip bedding
- 11 Strike-slip schistosity and cleavage
- 12 Folding
- 13 Shearing
- 14 Faults and/or fracture zones
- 15 Old workings
- 16 Trench line
- 17 0-40 000 80-400

0 500m
Scale 1:5000

ARCO Norway Inc. Hard Minerals Section					
ROMBAKEN					
Haugfjellet - Geological Map					
Drawn	Checked	BY/AD	Date	Cor. No.	Gen. No.
Report	Project	67	Drawing	Map Sheet	Scale
				1:5000	

0 kilometre 1



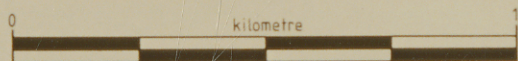
DIGHEM anomaly

- ◆ > 100 mho
- ◆ 50 - 100 mho
- ◆ 20 - 50 mho
- ◆ 10 - 20 mho
- ◆ 5 - 10 mho
- ◆ 3 mho
- ◆ Indeterminate
- ◆ Thick, >10 m

GENIE anomaly

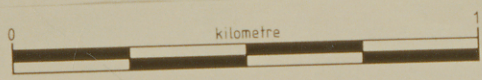
- ▬ > 50 mho
- ▬ 25 - 50 mho
- ▬ 10 - 20 mho
- ▬ 5 - 10 mho
- ▬ Probable
- ▬ Conductive zone
- ▬ Coincident Mag-high

Per Abildgaard 1988



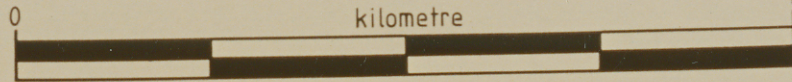


Cu	>90 % ILE	100 ppm
	>95 " "	134 "
Pb	>90 % ILE	120 ppm
	>95 " "	310 "
Zn	>90 % ILE	378 ppm
	>95 " "	578 "

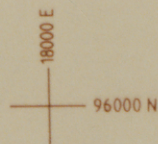


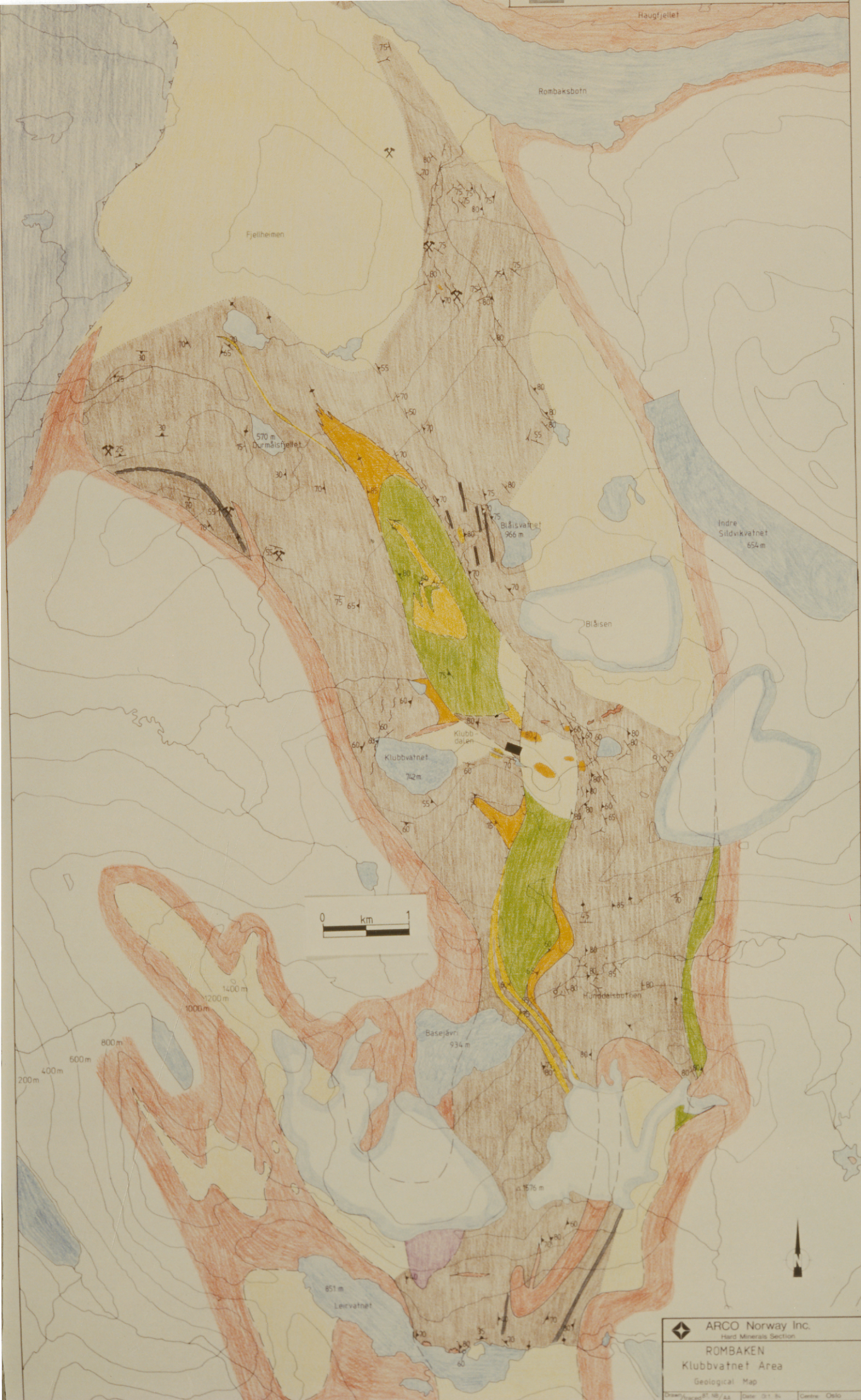
LEGEND

Cu	>90 % ILE	100 ppm
	>95 " "	134 "
Pb	>90 % ILE	120 ppm
	>95 " "	310 "
Zn	>90 % ILE	378 ppm
	>95 " "	578 "



◇ Au 0.48 (5m)





Pb 0.8
Ag 17

Pb 11.1
Au 1.1
Ag 99
Au 0.2

0 km 1

Zn 1.0 - 13.6
Pb 0.8 - 3.2
Ag 20 - 220

Zn 1.5
Pb 0.8

Zn 0.8
Pb 0.3

Zn 0.9 - 2.6
Pb 0.6 - 2.5
Au 0.1
Ag 17

Au 0.1
Au 0.2

Pb 6.8
Au 0.4
Ag 27

Zn 1.1
Pb 8.1
Au 0.8
Ag 260

Zn 11.7
Pb 2.1
Au 0.5
Ag 56

Pb 1.3
Ag 11

Zn 0.1
Pb 0.2

Zn 17
Pb 0.5

Zn 0.3

Zn 0.1

Pb 0.8
Cu 0.1
Ag 48

Zn 0.3

Pb 1.3
Au 0.1
Ag 16

INFERRED DEPOSITIONAL ENVIRONMENT

Fig. 15

ROMBAK BASIN (not to scale)

